EXHIBIT A

Marked-up version of the above amended claims pursuant to 37 C.F.R. 1.121(c)(1)(ii).

10. A method of making a spatially-addressable array of at least 500 different compounds, each of which is in solution, said compounds having a same common linear, branched, or cyclic molecular core comprising at least three atoms of carbon, nitrogen, oxygen, phosphorus or sulfur and at least two structural diversity elements attached thereto, said array comprising at least a first sub-array and a second sub-array, wherein the compounds composing the first sub-array each have at least one common structural diversity element, and the compounds composing the second sub-array each have at least one common structural diversity element, said method comprising the steps of:

(a) providing at least 500 reaction vessels organized into at least first and second sub-arrays;

(b) adding reactants to each of the reaction vessels in a manner such that, when reacted, the reactants form the compounds of the sub-arrays in the array, wherein each reaction vessel contains substantially only one compound and such that the compounds composing each sub-array differ from one another by one change in a structural diversity element; and

(c) concurrently reacting the contents of the reaction vessels under appropriate solution-phase conditions in one or more cycles to form all compounds of the sub-arrays in the array.

11. A method of making a spatially-addressable combinatorial array of at least 500 compounds in solution in multiple cycles, said method comprising the steps of:

(a) apportioning into a plurality of reaction vessels that are identifiable by their spatial addresses (i) a first plurality of reactants, each reactant comprising a same first reactive group and a different first structural diversity element such that the reactants composing the first plurality differ from one another, with one first reactant per reaction vessel; and (ii) a second reactant comprising a second reactive group and a second structural diversity element, with one second reactant per reaction vessel; and

(b) concurrently reacting said first and second reactants in each of the plurality of reaction vessels under solution phase conditions wherein the first and second reactive groups react with one another by an addition reaction to form a compound; and

(c) repeating steps (a) and (b), thus forming the combinatorial array of at least 500 different compounds in solution;

wherein each reaction vessel contains substantially only one compound,

wherein each compound composing the combinatorial array comprises a same common linear, branched, or cyclic molecular core comprising at least three atoms of carbon, nitrogen, oxygen, phosphorus or sulfur having the first and second structural diversity elements attached thereto, and further wherein the compounds composing the array differ from one another by at least one change in a structural diversity element.

22. A method for making a spatially-addressable combinatorial array of compounds in solution, the compounds having a common molecular core structure and at least two structural diversity elements, wherein the array comprises at least 500 different compounds, the method comprising:

(a) selecting reagents suitable for preparing the compounds of the array;

(b) providing at least 500 spatially-addressable reaction vessels;

(c) apportioning the reagents into the reaction vessels; and

(d) concurrently reacting the reagents in the reaction vessels in one of more cycles under solution phase conditions such that all the compounds of the array are formed in solution;

wherein each reaction vessel contains substantially only one compound,

wherein each compound composing the combinatorial array comprises a same common linear, branched, or cyclic molecular core comprising at least three atoms of carbon, nitrogen, oxygen, phosphorus or sulfur, said core having at least two structural diversity elements attached thereto, and further wherein the compounds composing the array differ from one another by one at least one change in a structural diversity element.